Echelon Biosciences Lipid Nanoparticles

RNA-based therapeutics have been under development for over 30 years however, the COVID-19 pandemic accelerated their development, chiefly with mRNA-based vaccines against the SARS-Cov2 virus. A key part of the technology are the lipid nanoparticles (LNPs) used to deliver RNA. Naked RNA cannot be injected as it is immunogenic, susceptible to enzymatic degradation, and is not taken up by cells. RNA packaged in LNPs protects it from degradation while circulating and allows it to enter cells and release the contents into the cytoplasm so the RNA can be used by ribosomes for protein synthesis.



ALC-0159 (Cat # N-2010)

ALC-0159 is a PEGylated lipid which has been used to form lipid nanoparticles for delivery of RNA. ALC-0159 is one of the components in the mRNA vaccines against SARS-CoV-2.



ALC-0315 (Cat # N-1020)

ALC-0315 is a PEGylated lipid which has been used to form lipid nanoparticles for delivery of RNA. ALC-0315 is one of the components in the mRNA vaccines against SARS-CoV-2



For most LNPs, four types of lipids are required for formation:

Ionizable Lipid: This is the key component of the LNP (35-50%) which binds and releases the RNA in the cell. Examples: ALC-0315, cKK-E12, SM-102, and Dlin-MC3-DMA

PEGylated Lipid: Small amounts of a PEG derivatized lipid (0.5-3%) is incorporated to increase the circulatory halflife in the body. Examples: ALC-0159, DSPE-mPEG, and DMG-mPEG

Cholesterol: Cholesterol is a structural "helper" lipid that makes up a significant part of the LNP (40-50%) and improves efficacy possibly by promoting membrane fusion and promoting endosomal escape.

Neutral phospholipids: Synthetic phospholipids (~10%) are also commonly used as structural "helper" lipids in LNP formulation to promote cell binding.





cKK-E12 (Cat # N-1012) cKK-E12 has been used to deliver siRNA in mice, rats, and primates. It shows low toxicity and is selective for liver parenchymal cells over liver, heart, lung, and kidney endothelial cells.

SM-102 (Cat # N-1102) SM-102 is an ionizable amino lipid that can be used in combination with other lipids to form LNPs. SM-102 has been used in the development of mRNA-based vaccines.

More LNP products

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Product	Catalog Number	Product	Catalog Number	
Ionizable Lipids		Ionizable Lipids	Ionizable Lipids	
DOTAP	N-1380	C12-200	N-1220	
306Oi10	N-1010	DLin-MC3-DMA	N-1282	
4A3-SC8	N-1438	DMG-PEG 2000	N-2014	
9A1P9	N-1919	DODMA	N-1382	
AA3-DLin	N-1003	DOTMA	N-1381	
Lipid 319	N-1319	Lipid 5	N-1005	
Helper Lipids		Helper Lipids	Helper Lipids	
Cholesterol	L-6012	DPPC	L-1116	
DSPC	L-1118	DOPE	L-2182	





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